



ADHD in older adults: A closer look

A thoughtful evaluation can ensure accurate diagnosis and optimal treatment

Van Ngo, MS-4
Medical Student

Amanda Springer, MS-4
Medical Student

Phillip Ruppert, PhD
Assistant Professor
Department of Psychiatry and Behavioral
Neuroscience

Noam Grysman, MD
Department of Psychiatry and Behavioral
Neuroscience

George Grossberg, MD
Samuel W. Fordyce Professor
Director, Geriatric Psychiatry

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Saint Louis University School of Medicine
St. Louis, Missouri

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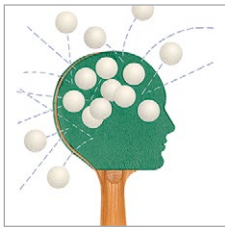
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For many years, attention-deficit/hyperactivity disorder (ADHD) was thought of as a disorder of childhood; however, it is now increasingly being recognized as a chronic, lifelong disorder that persists into adulthood in approximately two-thirds of patients.¹ While our knowledge about ADHD in adults has increased, most research in this population focused on young or middle-aged adults; less is known about ADHD in older adults. Older adults with ADHD may be newly diagnosed at any point in their lives, or not at all.² Because ADHD may present differently in older adults than in children or young adults, and because it may impair domains of life in different ways, a closer look at late-life ADHD is needed. This article summarizes the literature on the prevalence, impairment, diagnosis, and treatment of ADHD in adults age >60.

Challenges in determining the prevalence

Few studies have examined the age-specific prevalence of ADHD among older adults.³ Compared with childhood ADHD, adult ADHD is relatively neglected in epidemiological studies, largely due to the absence of well-established, validated diagnostic criteria.^{1,4} Some experts have noted that DSM-5's ADHD criteria were designed for diagnosing children, and the children-focused symptom threshold may not be useful for adults because ADHD symptoms decline substantially with age.² One study evaluating DSM-5 ADHD criteria in young adults (N = 4,000, age 18 to 19) found ADHD was better diagnosed when the required number of clinically relevant inattention and hyperactivity symptoms was reduced from 6 to 5 for each category.⁵ They also found the DSM-5 age-at-onset criterion of symptoms present





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ADHD symptoms might not manifest until stressors at critical points in life exceed an individual's capacity to compensate



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Table 1 Common co-occurring symptoms of late-life ADHD

Mood disorders
Anxiety
Loneliness
Decreased mobility
ADHD: attention-deficit/hyperactivity disorder
Source: References 14,17

before age 12 had a significant effect on ADHD prevalence, reducing the rate from 23.7% (95% CI, 22.38 to 25.02) to 5.4% (95% CI, 13.99 to 16.21).⁵ This suggests that strict usage of DSM-5 criteria may underestimate the prevalence of ADHD in adults, because ADHD symptoms may not be detected in childhood, or self-reporting of childhood ADHD symptoms in older adults may be unreliable due to aging processes that compromise memory and recall. These findings also indicate that fewer ADHD symptoms are needed to impair functioning in older age.

Determining the prevalence of ADHD among older adults is further complicated by individuals who report symptoms consistent with an ADHD diagnosis despite having never received this diagnosis during childhood.⁶⁻⁸ This may be due to the considerable number of children who meet ADHD criteria but do not get a diagnosis due to limited access to health care.⁹ Thus, many studies separately analyze the syndromic (with a childhood onset) and symptomatic (regardless of childhood onset) persistence of ADHD. One epidemiological meta-analysis found the 2020 prevalence of syndromic ADHD in adults age >60 was 0.77% and the prevalence of symptomatic ADHD was 4.51%, which translates to 7.91 million and 46.36 million affected older adults, respectively.⁸ Other research has reported higher rates among older adults.^{6,7,10} The variations among this research may be attributed to the use of different diagnostic tools/criteria, study populations, sampling methods, or DSM versions. Heterogeneity among this research also further supports the idea that the prevalence of ADHD is

heavily dependent on how one defines and diagnoses the disorder.

Reasons for late-life ADHD diagnosis

There are many reasons a patient may not be diagnosed with ADHD until they are an older adult.¹¹ In addition to socioeconomic barriers to health care access, members of different ethnic groups exhibit differences in help-seeking behaviors; children may belong to a culture that does not traditionally seek health care even when symptoms are evident.^{6,9} Therefore, individuals may not receive a diagnosis until adulthood. Some experts have discussed the similarity of ADHD to other neurodevelopmental disorders, such as autism spectrum disorder or social communication disorder, where ADHD symptoms may not manifest until stressors at critical points in life exceed an individual's capacity to compensate.²

The life transition model contextualizes ADHD as being associated with demand/resource imbalances that come and go throughout life, resulting in variability in the degree of functional impairment ADHD symptoms cause in older adults.^{2,12} Hypothetically, events in late life—such as the death of a spouse or retirement—can remove essential support structures in the lives of high-functioning individuals with ADHD. As a result, such events surpass these individuals' ability to cope, resulting in a late-life manifestation of ADHD.

The plausibility of late-onset ADHD

In recent years, many studies identifying ADHD in adults have been published,^{2,10,12-15} including some that discuss adult ADHD that spontaneously appears without childhood symptoms (ie, late-onset ADHD).^{2,4,12} Research of late-onset ADHD attracts attention because the data it presents challenge the current rationale that ADHD symptoms should be present before age 12, as defined by DSM-5 criteria. While most reports of late-onset ADHD pertain to younger adults, little evidence exists to reinforce the concept; to date just 1 study has reported cases of late-onset ADHD in older adults

Table 2

Differential diagnosis for ADHD symptoms in older adults

Category	Examples
Neurologic causes	Brain tumors, traumatic brain injury, postconcussive syndrome, stroke, neurocognitive disorders
Psychiatric causes	Mood disorders, substance use disorders
Medical causes	Vitamin B12 deficiency, hyperthyroidism, hypothyroidism, hyperparathyroidism, infectious diseases
Other causes	Impaired vision and hearing, obstructive sleep apnea, medication adverse effects (especially with polypharmacy)

ADHD: attention-deficit/hyperactivity disorder
Source: References 11,15,20-23

($n = 7$, age 51 to 59).¹¹ In this study, Sasaki et al¹¹ acknowledged the strong possibility their cases may be late manifestations of long-standing ADHD. Late-onset ADHD is further challenged by findings that 95% of individuals initially diagnosed with late-onset ADHD can be excluded from the diagnosis with further detailed assessment that accounts for co-occurring mental disorders and substance use.¹⁶ This suggests false positive cases of late-onset ADHD may be a symptom of narrow clinical assessment that fails to encompass other aspects of a patient's psychiatric profile, rather than an atypical ADHD presentation.

Comorbidity and psychosocial functioning

ADHD symptoms and diagnosis in older adults are associated with clinically relevant levels of depression and anxiety. The Dutch Longitudinal Aging Study Amsterdam (LASA) examined 1,494 older adults (age 55 to 85) using the Diagnostic Interview for ADHD in Adults version 2.0.¹⁰ The 231 individuals identified as having symptoms of ADHD reported clinically relevant levels of depressive and anxiety symptoms. ADHD was significantly associated with these comorbid symptoms.

Little is known regarding the manifestation of symptoms of ADHD in older age and the difficulties these older adults face. Older adults with ADHD are more often divorced and report more loneliness than older adults without this disorder, which suggests loneliness in older age may be

more pressing for the older ADHD population.¹⁷ ADHD in older adults has also been associated with poor quality-of-life measures, including moderate to severe problems in mobility, self-care, usual activity, pain/discomfort, and anxiety/depression (*Table 1*,^{14,17} page 20).

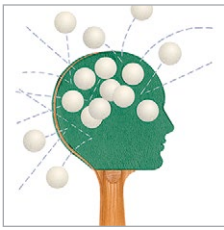
Qualitative research has described a domino effect of a lifetime of living with ADHD. In one American study, older adults with ADHD ($N = 24$, age 60 to 74) reported experiencing a tangible, accumulated impact from ADHD on their finances and long-term relationships with family, friends, and coworkers.¹³ Another study utilizing the Dutch LASA data examined how ADHD may impact patient's lives among participants who were unaware of their diagnosis.¹⁸ One-half of patients reported low self-esteem, overstepping boundaries, and feeling different from others. When compared to younger adults with ADHD, older adults report significantly greater impairments in productivity and a worse life outlook.¹⁹

Differential diagnosis

When assessing whether an older adult has ADHD, it is important to consider other potential causes of their symptoms (*Table 2*^{11,15,20-23}). The differential diagnosis includes impaired vision and hearing as well as medical illness (vitamin B12 deficiency, hyperthyroidism, hypothyroidism, hyperparathyroidism, and infectious diseases such as herpes simplex virus or syphilis).^{11,15,20-23} Neurological causes include

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ADHD in older adults is associated with clinically relevant levels of depression and anxiety



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The differential diagnosis of ADHD in older adults includes impaired vision/hearing, medical illness, and neurological causes

Table 3

Neuropsychological manifestations of ADHD in older adults

Executive impairment
Inattentiveness
Difficulty with multitasking
Difficulty with organization
Difficulty starting and finishing ADLs
Impulsiveness
Mood lability
Excessive talking
Distractibility
ADHD: attention-deficit/hyperactivity disorder; ADLs: activities of daily living
Source: References 11,24,25

brain tumors, traumatic brain injuries, post-concussive syndrome, stroke, and neurocognitive disorders.^{11,15,20-23} Other potential causes include obstructive sleep apnea, mood disorders, substance use disorders, and medication adverse effects (especially with polypharmacy).^{11,15,20-23} In this population, other causes are often responsible for “late-manifestation ADHD symptoms.”^{11,15} Neurocognitive disorders and other psychiatric conditions are especially difficult to differentiate from ADHD.

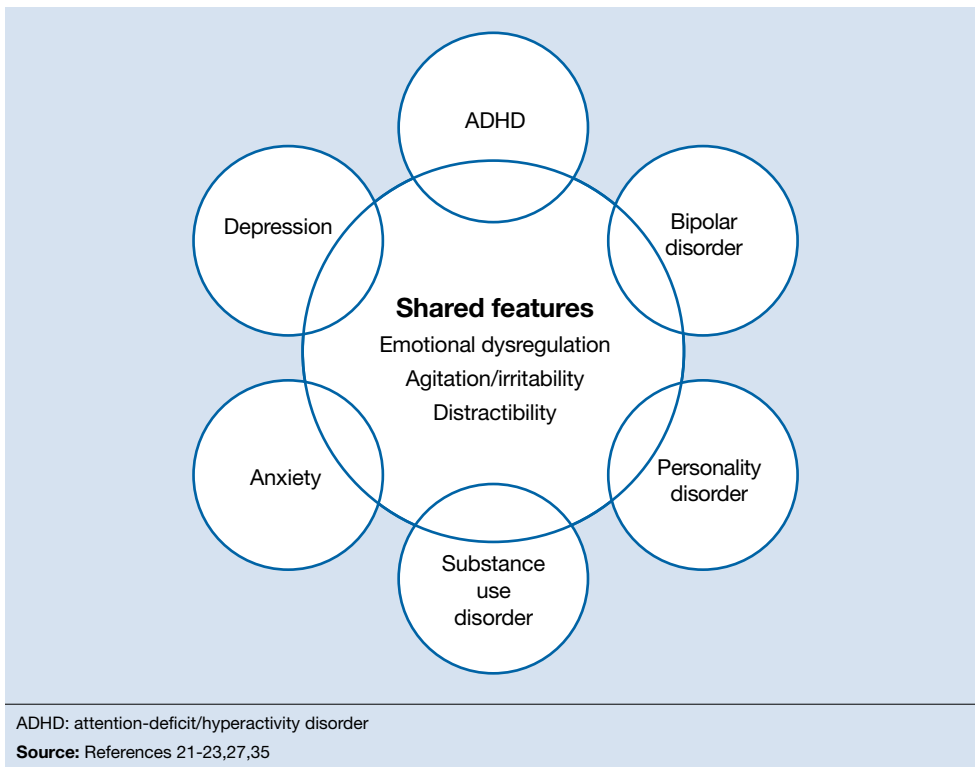
In older adults, ADHD symptoms include frontal-executive impairments, inattentiveness, difficulty with organization or multitasking, forgetfulness, and challenges involving activities of daily living or socialization that can appear to be a mild or major neurocognitive disorder (*Table 3*^{11,24,25}). This includes major neurocognitive disorder due to Alzheimer’s disease, Lewy body disease, and vascular disease.^{2,26} However, frontotemporal lobar degeneration is reported to have more symptom overlap with ADHD.^{21,22,26,27} A way to differentiate between neurocognitive disorders and ADHD in older adults is to consider that patients with neurocognitive disorders often progress to visual hallucinations and more extreme personality changes than would be expected in ADHD.¹¹ Each disease also has its own identifiable characteristics. Extreme changes in memory are often

Alzheimer’s disease, personality changes suggest frontotemporal lobar degeneration, stepwise decline is classic for vascular disease, and parkinsonian features may indicate dementia with Lewy bodies.²¹ In addition, the onset of ADHD usually occurs in childhood and can be traced throughout the lifespan,² whereas neurocognitive diseases usually appear for the first time in later life.^{2,28} There are nuances in the nature of forgetfulness that can distinguish ADHD from neurocognitive disorders. For instance, the forgetfulness in early-onset Alzheimer’s disease involves “the lack of episodic memories,” while in contrast ADHD is thought to be “forgetfulness due to inadvertence.”¹¹ Furthermore, patients with neurocognitive disorders are reported to have more severe symptoms and an inability to explain why, whereas those with ADHD have a steady level of symptoms and can provide a more comprehensive story.²⁴ Two recent studies have shown that weak performance on language tests is more indicative of a neurodegenerative process than of ADHD.^{29,30} Research has suggested that if an older adult shows a sudden, acute onset of ADHD-like symptoms, this is most likely reflective of cognitive decline or a mood disorder such as depression.^{2,15,24}

Several other psychiatric conditions share many symptoms with ADHD. Overlapping symptomology between ADHD and mood and anxiety disorders presents challenges.²⁷ Emotional dysregulation is a feature of adult ADHD, and this often causes a mood disorder to be diagnosed without considering other possible explanations.^{21,22,27,31-34} Features of mania can overlap with ADHD symptoms, including psychomotor agitation, talkativeness, and distractibility.²⁷ Several other disorders also include distractibility, such as depression, anxiety, and substance use disorders.³⁵ Depression and anxiety can be an outcome of untreated ADHD, or can co-occur with ADHD.^{21-23,27} ADHD can also co-occur with bipolar disorder (BD), substance use disorders, and personality disorders (borderline and antisocial personality disorder) (*Figure 1*,^{21-23,27,35} page 23). One suggested method of establishing an

Figure 1

Overlapping symptomology of ADHD and other psychiatric disorders



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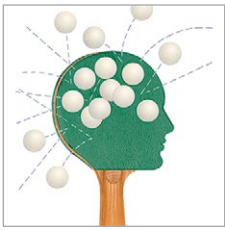
If an older adult has a sudden, acute onset of ADHD-like symptoms, it is most likely reflective of cognitive decline or a mood disorder

appropriate diagnosis is to study the efficacy of the treatment retrospectively. For example, if a patient is presumed to have depression and they do not respond to several selective serotonin reuptake inhibitors, this may be undetected ADHD.²⁷ In addition, the argument about the chronicity of the symptoms should also be considered. ADHD symptoms are pervasive whereas BD symptoms are episodic.³⁵ Depression can be chronic; however, there are often discrete major depressive episodes. It is important to have a clear timeline of the patient's symptoms. Ask about age of onset, because in theory, ADHD is supposed to start in childhood.²² It is sometimes difficult to ascertain this information because many older adults grew up during a time where ADHD was not a recognized diagnosis.²¹

Diagnosis and workup

The key aspects of diagnosing ADHD are the interview based on DSM-5 criteria,

exclusion of other diagnoses, and collateral information. Research has shown that clinical interviews and longitudinal family histories provide critical information that can differentiate ADHD from other psychiatric conditions.³⁵ DSM-5 criteria are adjusted for adults: 5 out of 9 criteria for inattention and/or hyperactivity-impulsivity must be fulfilled, as opposed to 6 out of 9 in children age <17.^{21,31,36} However, no criteria are specific for older adults.³⁷ Since the differential diagnosis involves multiple entities, it is important to follow DSM-5 criteria for ADHD, which include eliminating other conditions that can explain these symptoms.¹⁵ Additionally, in DSM-5, the age-of-onset threshold for ADHD diagnosis was increased from 7 and younger to 12 and younger, addressing criticism that the previous cutoff was too restrictive.^{24,31} The age of onset of childhood symptoms can be challenging to verify in older adults. Older patients can have unreliable memories and their childhood records are not always available.^{2,20} In this population, childhood



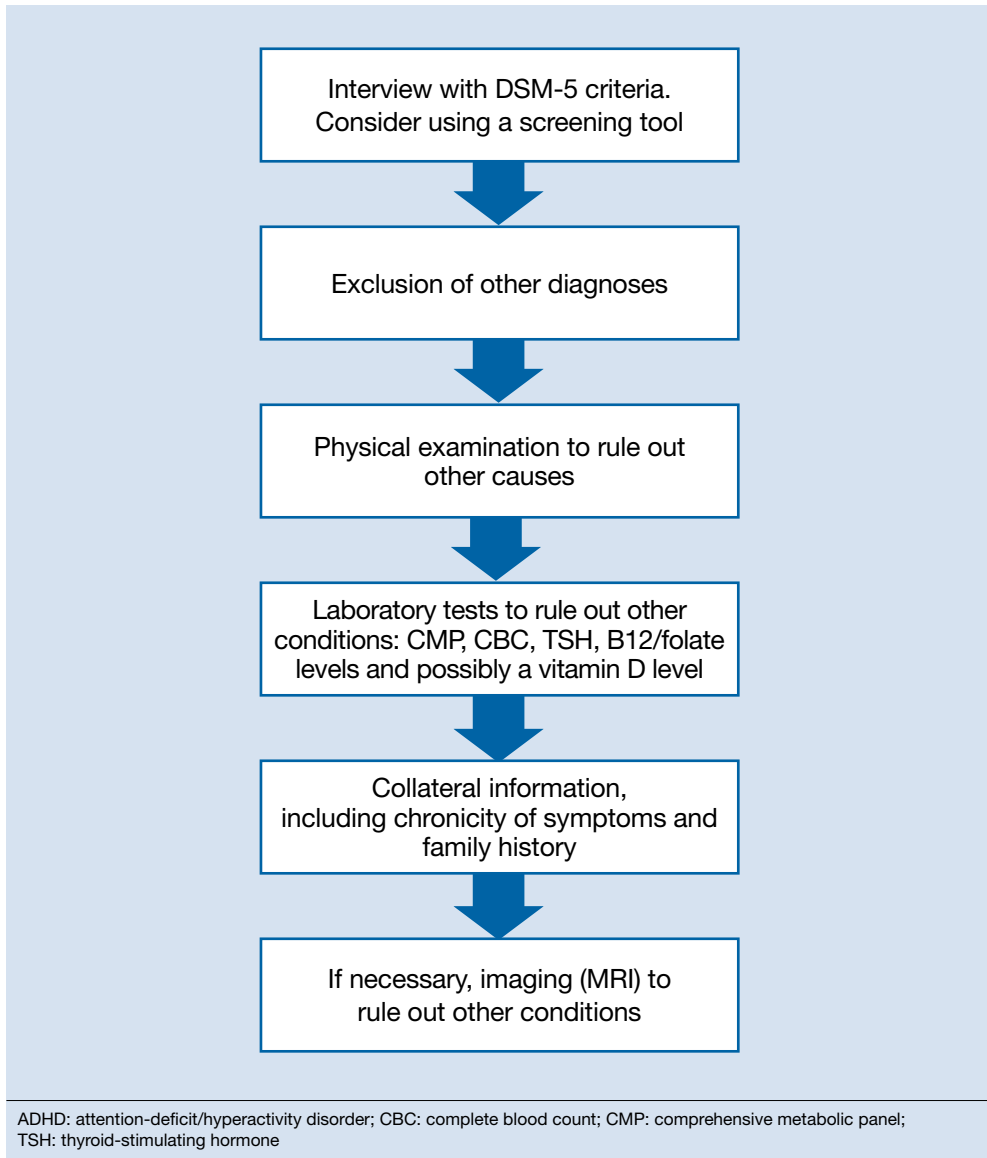
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To receive an ADHD diagnosis, the patient should have experienced some symptoms of the disorder within their first 50 years of life

Figure 2

ADHD workup in older adults



symptoms are mainly underreported but sometimes overreported.^{10,38} However, to establish a diagnosis, the patient should have experienced some symptoms of the disorder within their first 50 years of life, including having impaired functionality in multiple settings.^{15,26} The goal is to establish the chronicity of this condition to distinguish it from other psychiatric conditions.²² Overall, using DSM-5 criteria without any modifications may lead to underdiagnosis of ADHD in adults.²³ At this time, however, DSM-5 remains the main criteria used to make a diagnosis.

While tools to assist in screening and diagnosing ADHD have been validated in adults, none have been validated specifically for older adults.²² Structured diagnostic interviews to diagnose ADHD include³⁹:

- Adult ADHD Clinical Diagnostic Scale version 1.2
- ADHD Lifespan Functioning interview
- Conners' Adult ADHD Diagnostic interview for DSM-IV
- Diagnostic Interview for ADHD in Adults version 2.0
- Structured Clinical Interview for DSM-5.

ADHD symptom measures that can be used for screening and to look at treatment response include³⁹:

- ADHD Rating Scale 5
- Adult ADHD Self-Report Scale Symptom Checklist

- Barkley Adult ADHD Rating Scale IV
- Barkley Quick-Check for Adult ADHD

Diagnosis

- Young ADHD Questionnaire
- RATE Scales.

Adult ADHD inventories consider problems that adults with ADHD face. These include³⁹:

• Brown Attention Deficit Disorders Scales—Adult version

- Conners' Adult ADHD Rating Scales
- Wender-Reimherr Adult Attention Deficit Disorder Scale.

Since these scales were not designed for older adults, they may miss nuances in this population.⁴⁰

It can be particularly perplexing to diagnose ADHD in older adults because the other possible causes of the symptoms are vast. During the interview, it is important to ask questions that may rule out other psychiatric, neurologic, and medical conditions.²¹ Screen for other diagnoses, and include questions about a patient's sleep history to rule out obstructive sleep apnea.²¹ To screen for other psychiatric conditions, the Mini International Neuropsychiatric Interview 5.0.0 may be used.²² Other tools include the Saint Louis University AMSAD screen for depression, the Geriatric Depression Scale, and the Beck Anxiety Inventory.^{28,41} To screen for cognitive functioning, the Saint Louis University Mental Status Exam, Montreal Cognitive Assessment, or Mini-Mental State Examination can be used.^{22,28,42,43} Once screening is performed, a physical and neurologic examination is the best next step.²⁶ Additionally, laboratory data and imaging can rule out other conditions; however, these are not routinely performed to diagnose ADHD.

Laboratory tests should include a comprehensive metabolic panel, complete blood count, thyroid-stimulating hormone level, B12/folate level, and possibly a vitamin D level.^{11,36} These tests cover several conditions that may mimic ADHD. Brain MRI is

not routinely recommended for diagnosing ADHD, though it may be useful because some research has found brain structural differences in individuals with ADHD.^{28,44,45}

Neurocognitive disorders have notable MRI findings that distinguish them from ADHD and each other.²⁴ If there is significant concern for neurocognitive disorders, more specific tests can be employed, such as CSF studies, to look for phosphorylated tau and beta amyloid markers.¹¹

Ask about family history (first-degree relative with ADHD) and obtain collateral information to make sure no other diagnoses are overlooked. Family history can help diagnose this disorder in older adults because there is evidence that ADHD runs in families.^{2,25} This evidence would ideally come from someone who has known the patient their entire life, such as a sibling or parent.²⁴ The collateral information will be especially helpful to discern the chronicity of the patient's symptoms, which would point toward a diagnosis of ADHD. To summarize (*Figure 2, page 24*):

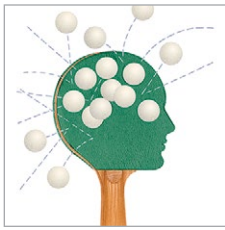
- obtain a thorough interview that may be supported by a screening tool
- rule out other conditions
- conduct a physical examination
- obtain laboratory results
- collect collateral information
- obtain neuroimaging if necessary.

Treatment

ADHD symptoms can be treated with medications and psychotherapy. Research has shown the efficacy of ADHD medications in older adults, demonstrating that treatment leads to better functioning in multiple settings and decreases the risk for developing comorbid psychiatric conditions (mood disorder, substance use disorders).^{25,27} Symptoms that improve with medication include attention, concentration, self-efficacy, functioning, self-esteem, psychomotor agitation, mood, energy, and procrastination.^{21,31,46} If a patient with ADHD also has other psychiatric diagnoses, treat the most impairing disorder first.²² This often means mood disorders and substance use disorders must be remedied before ADHD is treated.²¹

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Medications for ADHD in older adults can improve functioning and decrease the risk for developing comorbid psychiatric disorders



ADHD in older adults

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Stimulants can be safe and efficacious for older adults if patients are carefully monitored for adverse effects

Medication options include stimulants and nonstimulants. First-line treatments are stimulant medications, including methylphenidate, amphetamines, and mixed amphetamine salts.^{12,22,27,31,35} Stimulants have shown significant efficacy in older adults, although the American Geriatrics Society's Beers Criteria list stimulants as potentially inappropriate for older adults.³³ Adults show significant improvement with methylphenidate.^{21,23,47} In an observational study, Michielsen et al⁴⁶ found stimulants were safe and efficacious in older adults if patients are carefully monitored for adverse effects, especially cardiovascular changes. Second-line treatments include the nonstimulant atomoxetine.^{12,22,27,31} Clonidine and guanfacine are FDA-approved for treating ADHD in children, but not approved for adults.²⁶ There is little evidence for other treatments, such as bupropion.^{12,22,27} All of these medications have adverse effects, which are especially important to consider in older adults, who experience age-related physiological changes.

Medications for ADHD symptoms are thought to act via catecholaminergic mechanisms.²¹ As a result, adverse effects of stimulants can include headache, appetite suppression, nausea, difficulty sleeping, tremor, blurred vision, agitation, psychosis, increased heart rate, arrhythmia, and hypertension.^{22,27,32-34} Especially in older adults, adverse effects such as reduced appetite, disrupted sleep, or increased blood pressure or heart rate may be harmful.^{21,23} Using caffeine or pseudoephedrine can exacerbate these adverse effects.²¹ Atomoxetine's adverse effects include appetite suppression, insomnia, dizziness, anxiety, agitation, fatigue, dry mouth, constipation, nausea, vomiting, dyspepsia, and increased heart rate or blood pressure.^{27,32,35} Genitourinary adverse effects have also been reported, including priapism (rare), decreased libido, and urinary hesitancy and retention.^{26,32} Before any medication is initiated, it is important to conduct a physical and neurologic examination and a detailed clinical interview.

Before starting medication, as with any medical treatment, conduct a risk vs benefit analysis. Record baseline values for the patient's heart rate, blood pressure, and

weight.^{23,26,27,31} During the interview, screen for family and personal cardiovascular conditions,^{27,33} and obtain an electrocardiogram for any patient with cardiovascular risks.^{23,26,27,31} Once the patient is deemed to be an appropriate candidate for pharmacologic treatment, begin with low doses and titrate the medication slowly until reaching a therapeutic level.^{23,48}

Medications should be combined with psychotherapy (eg, cognitive-behavioral therapy or dialectical behavioral therapy) and other lifestyle changes (exercise, mindfulness, support groups).^{18,22,23,27,31,49} Psychotherapy can help patients come to terms with receiving an ADHD diagnosis later in life and help with organization and socialization.^{12,50} Pharmacologic treatments are thought to be helpful with attention challenges and emotional instability.⁵⁰ Taken together, medications and behavioral interventions can help individuals experience an improved quality of life.

Future directions

Given the relatively recent interest in ADHD in older adults, there are several areas that need further research. For future editions of DSM, it may be prudent to consider establishing ADHD criteria specific to older adults. Research has also shown the need for clear diagnostic and validated tools for older adults.⁸ Few analyses have been undertaken regarding pharmacotherapy for this population. Randomized controlled clinical trials are needed.^{23,37,48} More research about the relative utility of psychotherapy and behavioral interventions would also be useful, given their potential to improve the quality of life for older adults with ADHD.

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Related Resources

- Children and Adults with Attention-Deficit/Hyperactivity Disorder. Living with ADHD: A lifespan disorder. <https://chadd.org/for-adults/living-with-adhd-a-lifespan-disorder/>
- Attention Deficit Disorder Association. Support groups for adults. <https://add.org/adhd-support-groups/>

Drug Brand Names

Amphetamine/ dextroamphetamine • Adderall	Bupropion • Wellbutrin Clonidine • Catapres Guanfacine • Intuniv
Atomoxetine • Straterra	Methylphenidate • Ritalin

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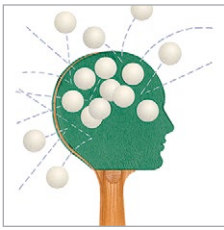
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Bottom Line

Although generally thought of as a disorder of childhood, attention-deficit/hyperactivity disorder (ADHD) has substantial effects in older adults. When the condition is appropriately diagnosed, pharmacologic treatment and psychotherapy are associated with improved quality of life for older patients with ADHD.

Clinical Point

Psychotherapy can help patients come to terms with receiving an ADHD diagnosis later in life



ADHD in older adults

Clinical Point

For future editions of DSM, it may be prudent to establish ADHD criteria specific to older adults

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